

SCHIZOTETRANYCHUS CELARIUS (BANKS) (ACARI: PROSTIGMATA) A MITE PEST OF BAMBOO; FIRST RECORDS FOR BRITAIN AND TWO NEW HOST RECORDS

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Abstract. Specimens of *Schizotetranychus celarius* (Banks) were discovered in August 1995 on a single bamboo plant (*Sasaella masmuneana*) in a private garden in Surrey. Further live specimens were collected from the same site in April 1998. A survey conducted by the Plant Health and Seeds Inspectorate (PHSI) discovered the mite at sites in Hampshire, Norfolk and Sussex. These are the first confirmed records of this mite in Britain, and it has since been intercepted several times on imported bamboo plants. Two new hosts are recorded, *S. masmuneana* and *Phyllostachys aurea*.

INTRODUCTION

Hardy species of bamboo are available in a variety of colours and forms, and as such are popular garden ornamentals, frequently used in amenity planting. They can be purchased from a large number of outlets including garden centres and specialist growers: they are also regularly imported from, or via, continental Europe.

A sample of leaves from a pot-grown bamboo, *Sasaella masmuneana* (Makino) Hatusima & Huroi var. 'Albostriata', collected on 21.viii.1995 from a private garden near Guildford, Surrey, was sent to the Central Science Laboratory (CSL) by Andrew Halstead of the Royal Horticultural Society (RHS), Wisley. Examination of the sample revealed active colonies of mites consisting of all life stages, inhabiting the areas between the veins on the under-surfaces of most of the leaves. Each colony was covered by a sheet of white silk with a small opening at each end. These structures are often referred to as 'nests' (Saito & Ueno, 1979). The nests varied in size, measuring 2–3 mm in width depending on the vein spacing, and up to 25 mm in length. On the more heavily infested leaves, nests filled all the available spaces between the veins. The feeding activity of the mites resulted in yellow chlorotic patches developing on the upper surfaces of the leaves above the nests, marring the appearance of the plant. The mites were identified as *Schizotetranychus celarius*, a new record for Britain, and on a new host *S. masmuneana*.

The *S. masmuneana* plant on which the mites were found had been purchased in 1994. A second sample of live specimens collected from the same plant by Andrew Halstead was received at CSL on 1.iv.1998. The mites had therefore bred and survived outdoors for at least four winters in our climate. Some growers were aware of the presence of mites on bamboos prior to 1995, and specialist bamboo growers were made aware of this pest (Stapleton, 1996).

IDENTIFICATION AND BIOLOGY

The genus *Schizotetranychus* Trägårdh occurs throughout the world and at present contains 114 described species (Bolland, Gutierrez & Flechtmann, 1998), many of which occur on monocotyledonous plants, particularly grasses and bamboos (Pritchard & Baker, 1955). Some species are considered to be economically important crop pests e.g. *S. andropogoni* (Hirst, 1926) on sugar cane (*Saccharum officinarum*), *S. asparagi* (Oudemans, 1928) on pineapple (*Ananas comosus* (L.)) and

S. baltazari Rimando, 1962 on *Citrus* spp. (Jeppson, Keifer & Baker, 1975). Of the 18 species recorded on bamboos, at least five produce the characteristic silk nests. Two species of *Schizotetranychus* are recorded in the checklist of the British Acari (Turk, 1953), namely *S. schizopus* (Zacher) on *Salix* spp. and *S. viburni* (Koch) on *Viburnum opulus* L. The latter species is synonymous with *Tetranychus urticae* Koch, 1836 (Pritchard & Baker, 1955). Since 1953, no other species of *Schizotetranychus* have been added to the British faunal list.

Superficially, members of the genus *Schizotetranychus* are typically tetranychid in appearance. They are differentiated from other genera by the tarsi that each bear a large pair of apical claws formed from the enlargements of the ventro-lateral empodial hairs, and by possessing 10 pairs of dorsal opisthosomal setae.

Adult *S. celarius* measure slightly less than 0.5 mm in length, are pale green to straw-coloured, slightly dorso-ventrally flattened (presumably an adaptation to living under the silken canopy of the nests) and bear two red spots located dorso-laterally, one on either side of the propodosoma. The immatures are opaque to translucent white. Under laboratory conditions, 25 C, 50–60% RH and a light to dark regime of 15L-9D, the developmental time from egg to adult was found to be approximately 14 days (Saitô & Ueno, 1979). This species is unusual as the adult mites actively defend the nests and offspring from predation by phytoseiid mites (Saitô, 1986; 1990a).

The complex *S. celarius* is considered to consist of three closely related species (Saitô, 1990b; Okasabe, Saitô & Sakagami, 1993), namely *S. celarius* (Banks), *S. miscanthi* Saitô and *S. longus* Saitô. The three are separated morphologically by differences in the lengths and positions of some of the dorsal body setae and the form of the empodial claws. It has been shown that the length of the dorsal setae is related to the size of the nests (Saitô & Takahashi, 1980). The specimens collected near Guildford were all typical of the species *celarius*.

KNOWN DISTRIBUTION AND HOSTS

S. celarius was first described from specimens collected off bamboo in Florida, USA (Banks, 1917), and has subsequently been recorded in other states of USA, including Hawaii. The species has also been recorded from Australia, China, France, Hong Kong, Japan, Taiwan and The Netherlands (Bolland, Gutierrez & Flechtmann, 1998). In Japan *S. celarius* is an occasional pest of rice (*Oryza sativa* L.) (Jeppson, Keifer & Baker, 1975). Other recorded hosts are: *Bambusa* sp., *Ficus pumila* L., *Miscanthus sinensis* Andersson, *Phyllostachys bambusoides* Siebold & Zuccarini, *P. mankinoides* Hayata, *P. nigra* (Loddiges ex Lindley) Munro, *Phyllostachys* sp., *Pleioblastus hindii* (Munro) Nakai, *P. variegatus* (Siebold ex Miquel) Makino, *Pleioblastus* sp., Poaceae, *Saccharum officinarum* L., *S. spontaneum* L., *Sasa kurilensis* (Ruprecht) Makino & Shibata, *S. nipponica* (Makino) Makino & Shibata and *S. senanensis* (Franchet & Savatier) Rehder. (Purseglove, 1972; Graf, 1974; Maberley, 1990; Bolland, Gutierrez & Flechtmann, 1998; Ohnberger, 1999).

During 1998/99 inspectors from the PHSI began surveying nursery stocks and imported plants in order to determine the distribution of this species in Britain. To date *S. celarius* appears to be of limited distribution, having been found in Hampshire, Norfolk, Surrey and Sussex.

Specimens collected in Sussex on 3.xii.1998 were notable as they were on a new bamboo host, *Phyllostachys aurea* Carrière ex A. & C. Rivière, that had been imported from Italy where neither *S. celarius* nor the genus *Schizotetranychus*, as currently recognised (Bolland, Gutierrez & Flechtmann, 1998), had been recorded previously.

CONCLUSION

Given the availability of suitable hosts, and the extent of the trade in these plants from countries where *S. celarius* is known to occur, this and other species of bamboo-inhabiting *Schizotetranychus* may be more widely distributed in Britain and continental Europe than the current records suggest. Surveying by the PHSI ceased at the end of August 1999. Any findings should be reported to the PHSI via the nearest office of the Ministry of Agriculture, Fisheries and Food.

Three slides consisting of 11 females and six males, and more than 100 preserved specimens are deposited at the CSL, and two slides consisting of seven females and four males are deposited in the collections of The Natural History Museum, London.

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